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EXAMINER	
SURVILLO, OLEG	

ART UNIT	PAPER NUMBER
2142	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,364	JUNG ET AL.	
	Examiner	Art Unit	
	OLEG SURVILLO	2142	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-180* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-180* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :09/14/07, 09/28/07, 02/14/08, 04/08/08.

DETAILED ACTION

Response to Amendment

1. Claims 1-180 remain pending in the application. Claims 8 and 56 are currently amended. No claims have been canceled. No new claims have been added.

It is noted that at pages 246-247 of remarks under the heading: Conclusion it is acknowledged that: *"Applicants may have during the course of prosecution cancelled and/or amended one or more claims"*. Several submissions pertaining to canceled claims were presented under the same section of remarks. Applicants' uncertainty regarding the status of all claims is not understood. Applicants are therefore requested to verify whether or not any claims were in fact canceled during the course of prosecution because the Examiner fails to see that any claims were canceled in the Amendment dated March 6, 2008.

Response to Arguments

2. With regard to the Applicants' remarks filed on March 6, 2008:

it is noted that Applicants' arguments regarding objections and rejections made in the Office action mailed September 4, 2007 are addressed in the same order as made in the last Office action.

Regarding objection to an abstract as non-enabling to determine the nature and gist of the technical disclosure, Applicant's arguments have been fully considered but they are not persuasive. Applicants argued that *since the abstract includes recitations included in the independent claims, thus the abstract permits one "to determine quickly*

... the nature and gist of the technical disclosure." This argument is not persuasive because the technical disclosure is not the same as the claimed invention. Also, the Examiner fails to see how a short single sentence is helpful in understanding the invention disclosed in the 44-page specification. Therefore, the objection is maintained. Applicants are encouraged to review the guidelines for drafting a proper abstract, as provided below under the heading: Specification.

Regarding the objection of claims 8 and 56 because of minor informalities, Applicants' amendment has been fully considered and is sufficient. Therefore, the objection has been withdrawn.

Regarding the rejection of claims 108-128 and 154-178 under 35 U.S.C. 101, Applicants' arguments have been fully considered but they are not persuasive. Applicants argued that since the specification shows that computer program executes on a processor, the claim is directed to a statutory subject matter. This argument is not persuasive because the features upon which Applicants rely (i.e., computer programs execute on processors) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. In addition, Applicants failed to either rebut presumption that 35 U.S.C. 112, sixth paragraph applies or explain why the particular structure pointed by the Examiner is not the correct structure identified by "means" in the claimed "mean-plus-function" language. The Examiner interpreted "means for creating one or more first-administered content indexes", "means for creating one or more second-administered content indexes", "means for obtaining at least a part of one or more first-administered content

indexes", "means for obtaining at least a part of one or more second-administered content indexes", and "means for creating a federated index" through invocation of 35 U.S.C. 112, sixth paragraph and reviewing the specification to identify the corresponding structure that performs the claimed function. Evidence was found in the specification that suggests to one of ordinary skill in the art that all claimed elements of the system (means for creating and means for obtaining) may be reasonably implemented as software programs per se. Therefore, 35 U.S.C. 101 rejection is deemed proper since the claimed system is directed to a software per se, failing to fall within a statutory category of invention. Thus, the rejection is maintained. It is noted that citation of *In re Alappat* case does not render Applicants argument persuasive because Applicants err in equating "a general purpose computer" of *In re Alappat* to "a system" of claim 108. Use of the word "system" does not inherently mean that the claim is directed to a **machine**. Only if at least one of the claimed elements of the system is a **physical part of a device** can the system as claimed constitute part of a device or a combination of devices to be a **machine** within the meaning of 35 U.S.C. 101. Regarding *In re Alappat* case, the Federal Circuit stated: *"... a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."* The Federal Circuit further stated: *"... a computer operating pursuant to software may represent patentable subject matter..."* Regarding *In re Alappat* case, the Examiner fails to see recitations of "a system" in statements of the Federal Circuit. If Applicants can find such a statement in the Board decision of *In re Alappat* case, they are requested to

provide a recitation of such in the next response. Thus, even in view of *In re Alappat*, claim 108 does not constitute patentable subject matter.

Regarding Applicants' citation of the specification at pages 40-41, the Examiner fails to see a recitation of "means for creating" or "means for obtaining" being a hardware element. Also, Applicants err in equating claimed "system" with "computer system" as discussed the cited portion of the specification because claimed "system" is broader than argued "computer system".

Regarding claim 128, Applicants' arguments are not persuasive for the reasons given below under the heading: Claim Rejections - 35 U.S.C. 101.

As to claim 154, Applicants' arguments have been fully considered but they are not persuasive for the same reasons as discussed above regarding claim 108.

Regarding claim 178, Applicants' arguments are not persuasive for the reasons given below under the heading: Claim Rejections - 35 U.S.C. 101.

Regarding the rejection of claims 36, 37, 84, and 85 under 35 U.S.C. 112, second paragraph, Applicants' arguments have been fully considered but they are not persuasive unless explicitly indicated otherwise. Regarding 35 U.S.C. 112, second paragraph rejection, Applicants argued that: *"the rejection fails to meet the requirements of 35 U.S.C. 132, 37 CFR 1.104(c)(2), MPEP 707.07(d), and MPEP 707.07(g). Therefore, the rejection is improper and should be withdrawn"*. This argument is not fully persuasive. In particular, Applicants relied on *35 U.S.C. 132* that recites: *"Whenever, on examination, any claim for a patent is rejected, or any objection or requirement made, the Director shall notify the applicant thereof, stating the reasons for such rejection, or*

objection or requirement, together with such ***information and references as may be useful in judging of the propriety of continuing the prosecution*** *..."* (emphasis added). The Examiner fails to see how this requirement is applicable to the rejection of claims 36, 37, 84, and 85 under 35 U.S.C. 112, second paragraph. In particular, the Examiner notes that 35 U.S.C. 112, second paragraph rejection does not necessitate reliance on references that constitute prior art under 35 U.S.C. 102(a), (b), or (e) in support of the 35 U.S.C. 112, second paragraph rejection. Since Applicants failed to articulate on how *35 U.S.C. 132* is relevant to the rejection made, their argument cannot be held as persuasive. Applicants also relied on *37 CFR 1.104(c)(2)* that recites: *"In rejecting claims for want of novelty or for obviousness, the examiner must cite the best references at his or her command.* ***When a reference*** *is complex or* ***shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable.*** *The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified"* (emphasis added). The Examiner fails to see how this requirement is applicable to the rejection of claims 36, 37, 84, and 85 under 35 U.S.C. 112, second paragraph. In particular, *37 CFR 1.104(c)(2)* is relevant for 35 U.S.C. 102(a), (b), or (e) rejections (in rejecting claims for want of novelty) and for 35 U.S.C. 103(a) rejections (in rejecting claims for want of obviousness). There is nothing in *37 CFR 1.104(c)(2)* that would require the Examiner to cite the best references in rejecting claims for being indefinite under 35 U.S.C. 112, second paragraph. Since Applicants failed to articulate on how *37 CFR 1.104(c)(2)* is relevant to the rejection made, their argument amounts to a general

allegation that 35 U.S.C. 112, second paragraph rejection fails to meet the requirements of *37 CFR 1.104(c)(2)*. Applicants further relied on *MPEP 707.07(d)* to argue that *the ground of rejection is not fully and clearly stated* because claims 36, 37, 84, and 85 were rejected for the same reasons as claims 12, 13, 32, and 33 in the co-pending application, without providing full discussion on specific reasons for the rejection in the Office action mailed September 4, 2007. This argument is persuasive. Therefore, for the purpose of obviating Applicants' concern, the rejection has been re-written in this Office action to substitute incorporation by reference of the specific reasons and discussion relied on in the rejection of claims in a co-pending application with the specific reasons and discussion as applicable to claims 36, 37, 84, and 85. Lastly, Applicants relied on *MPEP 707.07(g)* that recites: *"piecemeal examination should be avoided as much as possible"*. The Examiner fails to see how this requirement is applicable to the rejection of claims 36, 37, 84, and 85 under 35 U.S.C. 112, second paragraph, as discussed regarding *35 U.S.C. 132* and *37 CFR 1.104(c)(2)* above.

Regarding the rejection of claims 19 and 67 under 35 U.S.C. 112, second paragraph, Applicants' arguments have been fully considered but they are not persuasive with respect to reliance on *35 U.S.C. 132, 37 CFR 1.104(c)(2), and MPEP 707.07(g),* and are persuasive with respect to reliance on *MPEP 707.07(d),* as discussed just above.

Regarding the rejection of claims 45 and 93 under 35 U.S.C. 112, second paragraph, Applicants' arguments have been fully considered but they are not persuasive. In particular, Applicants argued that: *"the Office action has supplied no text,*

reference, or knowledge explaining why "established standards or protocols" as recited in claims 45 and 93, would be indefinite to one of ordinary skill in the art". The Examiner disagrees. The Office action has fully explained why "established standards or protocols" as recited in claims 45 and 93 would be indefinite to one of ordinary skill in the art. Therefore, Applicants' argument is not persuasive.

Regarding the rejection of claims 46 and 94 under 35 U.S.C. 112, second paragraph, Applicants' arguments have been fully considered but they are not persuasive. Applicants' presented essentially the same argument that: *"the Office action has supplied no text, reference, or knowledge explaining why "publishing … established standard or protocol" as recited in claims 46 and 94, would be indefinite to one of ordinary skill in the art".* This argument is not persuasive for the same reasons as discussed just above.

Regarding the rejection of claims 47 and 95 under 35 U.S.C. 112, second paragraph, Applicants' arguments have been fully considered but they are not persuasive. Applicants' presented essentially the same argument that: *"the Office action has supplied no text, reference, or knowledge explaining why "encryption utilizing at least one of a private and a public key" as recited in claims 47 and 95, would be indefinite to one of ordinary skill in the art".* This argument is not persuasive for the same reasons as discussed just above.

Regarding the rejection of claims 179 and 180 under 35 U.S.C. 102(b) as being anticipated by Mulgund et al., Applicants' arguments have been fully considered but they are not persuasive. Therefore, the rejection is maintained.

As to claim 179, Applicants argued that the Office action fails to state a prima facie case of anticipation because the cited prior art (Mulgund et al.) fails to identify the same elements as in claim 179. In particular, Applicants asserted that Mulgund does not show verbatim the language of the claim. The Examiner disagrees because in order to for an Examiner to establish a prima facie case of anticipation of an Applicants' claim, the Examiner must interpret the claim. If it could be shown that the cited prior art discloses the claimed limitations in exactly the same words, no claim interpretation would be necessary. Therefore, Office action is not required to identify a reference that would repeat claim language verbatim.

As to claim 179, Applicants further argued that: *"the Office action has supplied no text, reference, or knowledge explaining why one skilled in the art should equate the above quoted material from Mulgund et al. with the recitation of claim 179"*. The Examiner disagrees for the same reasons as discussed above, wherein the quoted material from Mulgund et al. is not required to repeat the claim language word for word, as claimed limitations are a subject to interpretation, such interpretation being as broad as the claim terms would reasonably allow, in light of the specification, when read by one skilled in the art with which the claimed invention is most closely connected. To that extent, one of ordinary skill in the art at the time of the invention would have interpreted at least one federated index creation agent resident in the computational system as a network modeling agent (14) resident in the database server (10) (Fig. 1 of Mulgund), wherein said at least one federated index creation agent configured to create at least a part of a federated index as including process of the network modeling agent (14)

creating an instantaneous state of the sensing network (par. [0020] of Mulgund), sensing data being indexed, as in Figs. 3 and 4 of Mulgund.

As to claim 180, Applicants argued that the Office action fails to state a prima facie case of anticipation because the cited prior art (Mulgund et al.) fails to identify the same elements as in claim 180. In particular, Applicants asserted that Mulgund does not show verbatim the language of the claim. The Examiner disagrees because in order to for an Examiner to establish a prima facie case of anticipation of an Applicants' claim, the Examiner must interpret the claim. If it could be shown that the cited prior art discloses the claimed limitations in exactly the same words, no claim interpretation would be necessary. Therefore, Office action is not required to identify a reference that would repeat claim language verbatim.

As to claim 180, Applicants further argued that: *"the Office action has supplied no text, reference, or knowledge explaining why one skilled in the art should equate the above quoted material from Mulgund et al. with the recitation of claim 180"*. The Examiner disagrees for the same reasons as discussed above, wherein the quoted material from Mulgund et al. is not required to repeat the claim language word for word, as claimed limitations are a subject to interpretation, such interpretation being as broad as the claim terms would reasonably allow, in light of the specification, when read by one skilled in the art with which the claimed invention is most closely connected. To that extent, one of ordinary skill in the art at the time of the invention would have interpreted at least one federated index resident in the computational system as including an identity of each of the sensing nodes in the network as well as any metadata about each

node, resident in the database server (10) (Figs. 3 and 4 of Mulgund), wherein said at least one federated index configured to contain at least a part of at least one of a mote-addressed content index as including metadata about each node (par. [0021] of Mulgund), content of a node being indexed, as in Figs. 3 and 4 of Mulgund.

Regarding the rejection of claims 1, 98-101, 104, 105, 108, 119-122, 125, 126, 129, 144-147, 150, 151, 154, 169-172, 175, and 176 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al., Applicants' arguments have been fully considered but they are not persuasive unless explicitly indicated otherwise.

As to claim 1, Applicants argued that the Office action fails to state a prima facie case of obviousness because the cited prior art (Mulgund et al.) fails to identify the same elements as in claim 1. In particular, Applicants asserted that Mulgund does not show verbatim the language of the claim. The Examiner disagrees because in order to for an Examiner to establish a prima facie case of anticipation of an Applicants' claim, the Examiner must interpret the claim. If it could be shown that the cited prior art discloses the claimed limitations in exactly the same words, no claim interpretation would be necessary. Therefore, Office action is not required to identify a reference that would repeat claim language verbatim.

As to claim 1, Applicants further argued that: *"the Office action has supplied no text, reference, or knowledge explaining why one skilled in the art should equate the above quoted material from Mulgund et al. with the recitation of claim 1"*. The Examiner disagrees for the same reasons as discussed above, wherein the quoted material from

Mulgund et al. is not required to repeat the claim language word for word, as claimed limitations are a subject to interpretation, such interpretation being as broad as the claim terms would reasonably allow, in light of the specification, when read by one skilled in the art with which the claimed invention is most closely connected. To that extent, one of ordinary skill in the art at the time of the invention would have interpreted the claimed limitations as discussed below with respect to claim 1 under the section heading: Claim Rejections - 35 USC 103, the interpretation not being repeated here for brevity.

As to claim 1, Applicants further argued that: *"grounding of the rejection of claim 1 on rejections included in co-pending application 10/816,375 fails to reject claim 1 with specificity and thus fails to meet the requirements of 35 U.S.C. 132, 37 CFR 1.104(c)(2), MPEP 707.07(d), and MPEP 707.07(g). Therefore, the rejection is improper and should be withdrawn".* This argument is persuasive with respect to the requirements of *MPEP 707.07(d).* In particular, Applicants relied on *MPEP 707.07(d)* to argue that *the ground of rejection is not fully and clearly stated* because claim 1 was rejected for the same reasons as claim 1 in the co-pending application, without providing full discussion on specific reasons for the rejection in the Office action mailed September 4, 2007. This argument is persuasive. Therefore, for the purpose of obviating Applicants' concern, the rejection has been re-written in this Office action to substitute incorporation by reference of the specific reasons and discussion relied on in the rejection of claims in a co-pending application with the specific reasons and discussion as applicable to claim 1.

As to claim 1, Applicants still further argued that: *"the Office action cites to Bennett et al. at the Abstract in support of combining Mulgund et al. and Bennett et al.,*

the Office action fails to supply citation to a teaching, suggestion, or motivation in the citations that support the combination of documents". Thus, Applicants' argument reduces to an allegation that the Office action failed to provide a motivation to combine the references. The Examiner disagrees with this argument. Motivation to modify the teachings of Mulgund with the teachings of Bennett was identified in the last Office action at page 9.

As to claim 1, Applicants further argued that: *"as the Office action provides no recitation as to the reasons for the obviousness of the combination, Applicants conclude that the Examiner is taking Official notice".* The Examiner disagrees. Applicants erred in their conclusion that the Office is taking Official notice with respect to claim 1 because no Official notice was taken.

As to any arguments pertaining to claim 1 that are not specifically addressed, they are either the same as those discussed above or moot in view of the ground of rejection being fully and clearly re-stated in this Office action.

As to any arguments pertaining to claims 2-180 that are not specifically addressed, they are the same as those discussed above.

Information Disclosure Statement

3. The information disclosure statement filed April 8, 2008 fails to comply with the provisions of 37 CFR 1.98 and MPEP § 609 because documents listed under section U.S. Patent Application Documents are not identified by a U.S. Patent Application

Publication Number, as required by column heading. As a result, these documents have not been considered. Also, all the documents listed in the IDSs filed 09/14/07 and 09/28/07 were listed in PTO-892 Notice of References Cited form that was mailed with the Office action on 09/04/07. Therefore, these documents were already considered.

Specification

4. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology

often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

6. The abstract of the disclosure is objected to because it does not enable the United States Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 108-128 and 154-180 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 108 incorporates means-plus-function limitations reciting a function to be performed rather than definite structure or materials for performing that function.

As to claim 108, limitations: "means for creating one or more first-administered content indexes", "means for creating one or more second-administered content indexes", "means for obtaining at least a part of one or more first-administered content indexes", "means for obtaining at least a part of one or more second-administered

content indexes", and "means for creating a federated index" are interpreted to invoke 35 U.S.C. 112, sixth paragraph.

The current specification must be reviewed to assist in identifying the corresponding structure that performs the claimed function. The specification shows that creating one or more content indexes is performed by an index creation agent (202) (bottom of page 9, page 10). Therefore, means for creating one or more first-administered content indexes and means for creating one or more second-administered content indexes are both interpreted to be an index creation agent (202). The specification also shows that obtaining at least a part of a first-administered (also, second-administered) content indexes of a first (also, second) set of motes and creating a federated index from at least a part of the first-administered content indexes and at least a part of the second-administered content indexes is performed by a federated index creation agent (914) (page 27, second paragraph). Therefore, means for obtaining at least a part of one or more first-administered content indexes, means for obtaining at least a part of one or more second-administered content indexes, and means for creating a federated index are all interpreted to be a federated index creation agent (914).

Since the index creation agent and the federated index creation agent are both computer programs, as evidenced by specification at page 8, last paragraph; page 15, lines 9-12; and page 27, second paragraph, a system of a computer software per se is not in one of the statutory categories.

The use of the word "system" does not inherently mean that the claim is directed to a machine. Only if at least one of the claimed elements of the system is a physical part of a device can the system as claimed constitute part of a device or a combination of devices to be a machine within the meaning of 35 U.S.C. 101.

Evidence is present in the specification that suggests to one of ordinary skill in the art that all claimed elements of the system (means for creating and means for obtaining) may be reasonably implemented as software programs per se, therefore the claim is rejected as a system of software per se, failing to fall within a statutory category of invention.

As to claims 109-128, additional means-plus-function language does not introduce any tangible elements by further limiting either one of means for creating or means for obtaining, which were identified above as software elements per se. Therefore, additional means fail to render a system of claim 108 statutory under 35 U.S.C. 101.

Claim 154 incorporates means-plus-function limitations reciting a function to be performed rather than definite structure or materials for performing that function.

As to claim 154, limitations: "means for obtaining at least a part of a first-administered content index", "means for obtaining at least a part of a second-administered content index", and "means for creating a federated index" are interpreted to invoke 35 U.S.C. 112, sixth paragraph.

The current specification must be reviewed to assist in identifying the corresponding structure that performs the claimed function. The specification shows that

obtaining at least a part of a first-administered (also, second-administered) content index from a first (also, second) set of motes and creating a federated index from at least a part of the first-administered content index and at least a part of the second-administered content index is performed by a federated index creation agent (914) (page 27, second paragraph). Therefore, means for obtaining at least a part of a first-administered content index, means for obtaining at least a part of a second-administered content index, and means for creating a federated index are all interpreted to be a federated index creation agent (914).

Since the federated index creation agent is a computer program, as evidenced by specification at page 8, last paragraph and page 27, second paragraph, a system of a computer software per se is not in one of the statutory categories.

The use of the word "system" does not inherently mean that the claim is directed to a machine. Only if at least one of the claimed elements of the system is a physical part of a device can the system as claimed constitute part of a device or a combination of devices to be a machine within the meaning of 35 U.S.C. 101.

Evidence is present in the specification that suggests to one of ordinary skill in the art that all claimed elements of the system (means for obtaining and means for creating) may be reasonably implemented as software programs per se, therefore the claim is rejected as a system of software per se, failing to fall within a statutory category of invention.

As to claims 155-178, additional means-plus-function language does not introduce any tangible elements by further limiting either one of means for obtaining or

means for creating, which were identified above as software elements per se. Therefore, additional means fail to render a system of claim 154 statutory under 35 U.S.C. 101.

As to claim 179, use of the word "system" and "computational system" does not inherently mean that the claim is directed to a machine. Only if at least one of the claimed elements of the system is a physical part of a device can the system as claimed constitute part of a device or a combination of devices to be a machine within the meaning of 35 U.S.C. 101. In the instant case, neither "computational system" nor "federated index creation agent" are positively identified as physical elements of the system. In particular, the specification fails to specifically define a "computational system" in such a way that would limit the computational system to embodiments containing at least one physical element. The specification also provides an evidence at page 8, last paragraph and page 27, second paragraph, that a "federated index creation agent" is a computer program per se. Therefore, it is reasonable to interpret the claimed system as covering an embodiment of software alone, failing to fall within a statutory category of invention. It is noted that "a set of motes" is not an element of the claimed system, but instead is, at best, for use with the claimed system.

As to claim 180, use of the word "system" and "computational system" does not inherently mean that the claim is directed to a machine. Only if at least one of the claimed elements of the system is a physical part of a device can the system as claimed constitute part of a device or a combination of devices to be a machine within the meaning of 35 U.S.C. 101. In the instant case, neither "computational system" nor

"federated index" are positively identified as physical elements of the system. In particular, the specification fails to specifically define a "computational system" in such a way that would limit the computational system to embodiments containing at least one physical element. The specification also provides an evidence at page 8, last paragraph and page 27, second paragraph, that a "federated index creation agent" is a computer program per se. Therefore, claimed "federated index" is a computer program product of the federated index creation agent. Absent an explicit and deliberate definition in the specification or limiting claim language, the broadest reasonable interpretation of "computer program product" which would be fairly conveyed to one of ordinary skill in the art is "produced computer program", as evidenced by Figure 11. Thus, it is reasonable to interpret the claimed system as covering an embodiment of software alone, failing to fall within a statutory category of invention. It is noted that "a set of motes" is not an element of the claimed system, but instead is, at best, for use with the claimed system.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 154-178 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

Claims 154-178 incorporate means-plus-function limitations reciting a function to be performed rather than definite structure or materials for performing that function.

As to claim 154, limitations: "means for obtaining at least a part of a first-administered content index", "means for obtaining at least a part of a second-administered content index", and "means for creating a federated index" are interpreted to invoke 35 U.S.C. 112, sixth paragraph.

The current specification must be reviewed to assist in identifying the corresponding structure that performs the claimed function. The specification shows that obtaining at least a part of a first-administered (also, second-administered) content index from a first (also, second) set of motes and creating a federated index from at least a part of the first-administered content index and at least a part of the second-administered content index is performed by a federated index creation agent (914) (page 27, second paragraph). Therefore, means for obtaining at least a part of a first-administered content index, means for obtaining at least a part of a second-administered content index, and means for creating a federated index are all interpreted to be a federated index creation agent (914).

Thus, if claim was written as "means for obtaining at least a part of a first-administered content index from a first set of motes, obtaining at least a part of a second-administered content index from a second set of motes, and creating a federated index from at least a part of the first-administered content index and at least a part of the second-administered content index", that claim would be a subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. Clearly, Applicants should

not be able to avoid an undue breadth rejection by a mere formalism of splitting a single means for performing three functions into three separate means.

As result, claim 154 is a single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, and is, therefore, subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. *In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983)*

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Claims 155-178 do not introduce at least another element by further limiting either one of means for obtaining or means for creating of claim 154. Hence, each of the claims 155-178 does not include at least two elements and therefore are subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph, as discussed above.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 19, 36, 37, 45-47, 67, 84, 85, and 93-95 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 19 and 67, the usage of inconsistent terminology in the claim language when referring to the same element renders the claim ambiguous because it is unclear whether a multi-mote index creation agent is the same element as a multi-mote index creation unit or agent and unit are two distinct elements. If it a multi-mote index creation unit is a distinct element, then there is insufficient antecedent basis for

"the multi-mote index creation unit" in the claim.

As to claims 36 and 84, the step of establishing an index-creating agent at the mote in response to said step of determining is ambiguous because the order of steps is unclear to the extent that it is inconsistent with the order provided in the specification. In particular, the preamble of each of claims 36 and 84 states that step of creating is performed after (in response to) step of determining. The body of the claim further limits the step of creating by introducing additional steps (establishing, determining, and associating). However, the step of establishing an index-creating agent at the mote in response to the step of determining is inconsistent with the specification. The specification shows at the bottom of page 9 and the top of page 10 that *"...index creation agent communicates with the device entities to find out what sensing functions are present and/or available at their various respectively associated devices..."* Thus, the specification identifies an index-creating agent as performing the step of determining (recited in claim 25 (and claim 73 by extension) and preamble of claim 36 (and claim 84 by extension)). Based on the specification, one of ordinary skill in the art would reasonably conclude that an index-creating agent is established prior to the step of determining in order for it to perform the step of determining. Therefore, the step of establishing an index-creating agent at the mote subsequently (in response to) step of determining, as currently claimed, is inconsistent with the specification and is, therefore, ambiguous.

Claims 37 and 85 contain same inconsistency, as discussed above, wherein the step of migrating to the mote is claimed to be performed in response to the step of

determining (recited in claim 25 (and claim 73 by extension) and preamble of claim 37 (and claim 85 by extension)).

If Applicants assert that the index creation agent does not perform the step of determining (of claims 25 and 73, and preamble of claims 36, 37, 84, and 85), as identified by the Examiner, the appropriate citation from the specification must be provided in the next response clearly indicating which component of the invention performs the recited step of determining.

Claims 45 and 93 are ambiguous because it is unclear what constitutes "established standards or protocols", which precludes the Examiner from adequately interpreting the words in the claim and establishing the metes and bounds of the claim. Appropriate correction to provide clarity and precision or concise explanation providing evidence of how each of the words recited in the phrase "established standards or protocols" can be defined and interpreted by one of ordinary skill in the art is required, such that a person of ordinary skill in the art could interpret the metes and bounds of the claim as to understand how to avoid infringement.

Claims 46 and 94 are ambiguous because it is unclear what is being meant by "publishing ... established standard or protocol", which precludes the Examiner from adequately interpreting the words in the claim and establishing the metes and bounds of the claim. Appropriate correction to provide clarity and precision or concise explanation providing evidence of how each of the words recited in the phrase "publishing ... established standards or protocols" can be defined and interpreted by one of ordinary

skill in the art is required. Applicants are requested to cite appropriate paragraphs of the specification when providing such evidence.

Claims 47 and 95 are ambiguous because it is unclear what is being meant by "selecting ... established standard or protocol comprises encryption utilizing at least one of a private and a public key", which precludes the Examiner from adequately interpreting the words in the claim and establishing the metes and bounds of the claim. Appropriate correction to provide clarity and precision or concise explanation providing evidence of how each of the words recited in the phrase " selecting ... established standard or protocol comprises encryption " can be defined and interpreted by one of ordinary skill in the art is required. Applicants are requested to cite appropriate paragraphs of the specification when providing such evidence.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 179 and 180 are rejected under 35 U.S.C. 102(b) as being anticipated by Mulgund et al. (US 2002/0161751 A1).

As to claim 179, Mulgund shows:

at least computational system [database server (10)] operably coupled with at least one of a first-administered set of motes (Fig. 1); and

at least one federated index creation agent resident in the computational system [network modeling agent (14)] (Fig. 1), said at least one federated index creation agent configured to create at least a part of a federated index [instantaneous state of the sensing network] (par. [0020] l. 17-20).

As to claim 180, Mulgund shows:

at least computational system [database server (10)] operably coupled with at least one of a first-administered set of motes (Fig. 1); and

at least one federated index resident in the computational system [metadata about each node] (Figs. 3 and 4), said at least one federated index configured to contain at least a part of at least one of a mote-addressed content index (par. [0021] – [0024]).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 1, 2-5, 8, 9, 11, 12, 14, 16, 20, 21, 23, 25, 36, 38, 39, 42-46, 48, 50-53, 56, 57, 59, 60, 62, 64, 68, 69, 71, 73, 84, 86, 87, 90-94, 96, 98-101, 104, 105, 108-112, 114-117, 119-122, 125, 126, 129-131, 133, 135, 137, 138, 140, 142, 144-147, 150, 151, 154-156, 158, 160, 162, 163, 165, 167, 169-172, 175, and 176 are rejected under 35

U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. (U.S. Patent No.: 5,615,367).

As to claim 1, Mulgund shows:

creating one or more first-administered content indexes for a first set of motes [building a database model by updating relational database logical design tables at each step of the discovering step, the model created comprised of an identity of each of the sensing nodes as well as any metadata about each node] (par. [0007], [0021]);

obtaining at least a part of the one or more first-administered content indexes of the first set of motes [visiting a node and retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata about each node (par. [0062]) wherein information is retrieved from a knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)];

creating one or more second-administered content indexes for a second set of motes [building a database model by updating relational database logical design tables at each step of the discovering step, the model created comprised of an identity of each of the sensing nodes as well as any metadata about each node] (par. [0007], [0021]);

obtaining at least a part of the one or more second-administered content indexes of the second set of motes [visiting a node and retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata about each node (par. [0062]) wherein information is retrieved from a

knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)].

Mulgund also shows creating a federated index from at least a part of the one or more first-administered content indexes and at least a part of the one or more second-administered content indexes [joint table containing metadata and identity of each sensing node] (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

Alternatively, Bennett shows creating a federated index from at least a part of the one or more first-administered content indexes and at least a part of the one or more second-administered content indexes [creating a design document from a first and second tables, each table containing an index] (summary of the invention, Fig. 5A).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by creating a federated index from at least a part of the one or more first-administered content indexes and at least a part of the one or more second-administered content indexes in order to aggregate information from first and second indexes [tables containing metadata] into a relational database (abstract, in Bennett).

As to claim 2, Mulgund shows:

aggregating at least a part of one or more mote-addressed content indexes from a first set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4), wherein the terms "node" and "mote" are interpreted to have the same meaning of small embedded

platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 3, Mulgund shows:

receiving at least a part of one or more mote-addressed indexes of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]).

As to claim 4, Mulgund shows:

creating one or more multi-mote content indexes of the first set of motes (Fig. 4, paragraph [0042]).

As to claim 5, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]).

As to claim 8, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]) from one or more motes to be included in the listing (paragraph [0061] and [0062]) wherein the second column in table 1 (CAL) shows the current links from the Node being visited.

As to claim 9, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 11, Mulgund shows:

receiving at least a part of one or more multi-mote content indexes of the first set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 12, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 14, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is

retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 16, Mulgund shows:

creating an aggregate of at least a part of one or more multi-mote content indexes of the first set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

As to claim 20, Mulgund shows:

receiving at least a part of one or more mote-addressed content indexes of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraphs [0025] and [0062]), wherein the terms "node" and "mote" are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 21, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 23, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 25, Mulgund shows:

determining at least one of a sensing function or a control function at a mote [discovering and maintaining the distributed sensor network topology (paragraph [0007]) wherein at least one of a sensing function or a control function is interpreted to be at least one of the data elements outlined in paragraphs 0021 – 0024]; and

creating one or more mote-addressed content indexes in response to said determining [building a database model by updating relational database logical design tables at each step of the discovering step (paragraph 0007)].

Mulgund also shows a sensor network modeling agent (summary of the invention) for performing the recited functions.

As to claim 36, Mulgund shows:

establishing an index-creating agent at the mote of the first set of motes [causing the network modeling agent to visit a first sensor node and mark the first node visited (paragraph 0007). Note that terms "node" and "mote" are interpreted to have same

meaning of small embedded platform that has one or more sensors (paragraph 0026) and therefore these terms are used here interchangeably];

determining a mote-network address of the mote (paragraphs [0021] and [0028] – [0031]); and

associating at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claim 38, Mulgund shows

determining a mote-network address of a mote of the first set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of control available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of control available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claim 39, Mulgund shows

determining a mote-network address of a mote of the first set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of sensing available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of sensing available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claims 42-44, the claimed limitations are interpreted broadly since the meaning of the recited limitations is not understood.

As to claims 42-44, Mulgund shows associating one or more mote-appropriate routing addresses [note addresses (see table 20 of Fig. 3)] with at least one mote-addressed content index (Fig. 3 and Fig. 4, paragraphs [0037]-[0038]) wherein mote-addressed content index could be addressed directly or indirectly depending on the implementation (paragraph [0042]).

Claims 45, 46, 93, and 94 will be examined as best understood.

As to claim 45 (and claim 93 by extension), and claim 46 (and claim 94 by extension), Mulgund shows selecting from one or more established standards or protocols and publishing at least a part of an identifier of the selected established standard or protocol [selecting and identifying selected protocol such as the Internet] (abstract).

As to claim 48, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 50, Mulgund shows:

aggregating at least a part of one or more mote-addressed content indexes from a second set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4), wherein the terms "node" and "mote" are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 51, Mulgund shows:

receiving at least a part of one or more mote-addressed indexes of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]).

As to claim 52, Mulgund shows:

creating one or more multi-mote content indexes of the second set of motes (Fig. 4, paragraph [0042]).

As to claim 53, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]).

As to claim 56, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]) from one or more motes to be included in the listing (paragraph [0061] and [0062]) wherein the second column in table 1 (CAL) shows the current links from the Node being visited.

As to claim 57, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 59, Mulgund shows:

receiving at least a part of one or more multi-mote content indexes of the second set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 60, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 62, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 64, Mulgund shows:

creating an aggregate of at least a part of one or more multi-mote content indexes of the second set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

As to claim 68, Mulgund shows:

receiving at least a part of one or more mote-addressed content indexes of the second set of motes [visiting a node and retrieving the information stored at the node]

(paragraphs [0025] and [0062]), wherein the terms "node" and "mote" are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 69, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 71, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 73, Mulgund shows:

determining at least one of a sensing function or a control function at a mote [discovering and maintaining the distributed sensor network topology (paragraph [0007]) wherein at least one of a sensing function or a control function is interpreted to be at least one of the data elements outlined in paragraphs 0021 – 0024]; and

creating one or more mote-addressed content indexes in response to said determining [building a database model by updating relational database logical design tables at each step of the discovering step (paragraph 0007)].

Mulgund also shows a sensor network modeling agent (summary of the invention) for performing the recited functions.

As to claim 84, Mulgund shows:

establishing an index-creating agent at the mote of the second set of motes [causing the network modeling agent to visit a first sensor node and mark the first node visited (paragraph 0007). Note that terms "node" and "mote" are interpreted to have same meaning of small embedded platform that has one or more sensors (paragraph 0026) and therefore these terms are used here interchangeably];

determining a mote-network address of the mote (paragraphs [0021] and [0028] – [0031]); and

associating at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claim 86, Mulgund shows

determining a mote-network address of a mote of the second set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of control available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of control available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claim 87, Mulgund shows

determining a mote-network address of a mote of the second set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of sensing available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of sensing available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claims 90-92, the claimed limitations are interpreted broadly since the meaning of the recited limitations is not understood.

As to claims 90-92, Mulgund shows associating one or more mote-appropriate routing addresses [note addresses (see table 20 of Fig. 3)] with at least one mote-addressed content index (Fig. 3 and Fig. 4, paragraphs [0037]-[0038]) wherein mote-addressed content index could be addressed directly or indirectly depending on the implementation (paragraph [0042]).

As to claim 96, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 98, Mulgund shows creating the federated index from at least a part of one or more multi-mote content indexes of the first set of motes (Fig. 4, par. [0042]).

As to claim 99, Mulgund shows creating the federated index from at least a part of at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index of the first set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 100, Mulgund shows creating the federated index from at least a part of one or more multi-mote content indexes of the second set of motes (Fig. 4, par. [0042]).

As to claim 101, Mulgund shows creating the federated index from at least a part of at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index of the second set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claims 104 and 150, Mulgund shows generating the federated index to have information pertaining to a currency of at least one entry of an administered content index [timestamp status] (Figs. 3 and 4).

As to claims 105 and 151, Mulgund shows generating the federated index to have information pertaining to an expiration of at least one entry of an administered content index [timestamp status] (Figs. 3 and 4, par. [0041]).

As to claim 108, Mulgund and, alternatively, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 1.

As to claim 109, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 2.

As to claim 110, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 3.

As to claims 111 and 116, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 25.

As to claim 112, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 9.

As to claim 114, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 50.

As to claim 115, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 51.

As to claim 117, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 57.

As to claim 119, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 98.

As to claim 120, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 99.

As to claim 121, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 100.

As to claim 122, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 101.

As to claim 125, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 104.

As to claim 126, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 105.

As to claim 129, Mulgund shows:

obtaining at least a part of a first-administered content index from a first set of motes [visiting a node and retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata about each node (par. [0062]) wherein information is retrieved from a knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)];

obtaining at least a part of a second-administered content index from a second set of motes [visiting a node and retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata

about each node (par. [0062]) wherein information is retrieved from a knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)].

Mulgund also shows creating a federated index from at least a part of the first-administered content index and at least a part of the second-administered content index [joint table containing metadata and identity of each sensing node] (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

Alternatively, Bennett shows creating a federated index from at least a part of the first-administered content index and at least a part of the second-administered content index [creating a design document from a first and second tables, each table containing an index] (summary of the invention, Fig. 5A).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by creating a federated index from at least a part of the first-administered content index and at least a part of the second-administered content index in order to aggregate information from first and second indexes [tables containing metadata] into a relational database (abstract, in Bennett).

As to claim 130, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 3.

As to claim 131, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 12.

As to claim 133, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 14.

As to claim 135, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 9.

As to claim 137, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 51.

As to claim 138, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 60.

As to claim 140, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 62.

As to claim 142, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 57.

As to claim 144, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 98.

As to claim 145, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 99.

As to claim 146, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 100.

As to claim 147, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 101.

As to claim 154, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 129.

As to claim 155, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 130

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As to claim 156, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 131.

As to claim 158, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 133.

As to claim 160, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 135.

As to claim 162, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 137.

As to claim 163, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 138.

As to claim 165, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 140.

As to claim 167, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 142.

As to claim 169, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 144.

As to claim 170, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 145.

As to claim 171, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 146.

As to claim 172, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 147.

As to claim 175, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 150.

As to claim 176, Mulgund in view of Bennett shows all the elements, as discussed above with respect to claim 151.

17. Claims 6, 7, 54, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. and in further view of Chiloyan et al. (US Patent No.: 7,165,109).

As to claims 6 and 54, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]) from a multi-mote registry [Nodes Table (20)].

Alternatively, Chiloyan shows:

obtaining a listing of devices from a registry [having an operational system accessing device registry to check if the particular peripheral device model is included in the current device registry] (col. 1 lines 50-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by obtaining a list of devices from a registry in order to check if the particular device model and necessary information about the device is in the registry (col. 1 lines 58-63 in Chiloyan).

As to claims 7 and 55, Mulgund shows:

obtaining a pre-loaded listing of motes [initial model construction listing] (paragraph [0046]) appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]).

Alternatively, Chiloyan shows:

obtaining a pre-loaded listing of devices [devices already included in the current device registry] (col. 1 lines 50-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by obtaining a pre-loaded list of devices in order to check if the particular device model and necessary information about the device is already included in the registry (col. 1 lines 58-63 in Chiloyan).

18. Claims 10, 13, 15, 17, 18, 22, 24, 40, 41, 49, 58, 61, 63, 65, 66, 70, 72, 88, 89, 97, 113, 118, 132, 134, 136, 139, 141, 143, 157, 159, 161, 164, 166, and 168 are

rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. and in further view of Kung et al. (US 2005/0021724 A1).

As to claim 10, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 13, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 15, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from

a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claims 17 and 18, Mulgund shows:

aggregating at least a part of a mote-addressed index of a multi-mote content index (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

Mulgund does not show that a mote-addressed index is a routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-

addressed routing/spatial index being aggregated in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

Alternatively to Kung, Madden (reference used in rejection of claim 19 below) shows a mote-addressed routing/spatial index at a mote (under 2.2 communication in sensor networks, paragraph 2).

As to claim 22, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position

of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 24, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 40, Mulgund shows:

determining a mote-network address of a mote of the first set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information related to devices of or proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of spatial information related to devices of or proximate to the mote.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by determining one or more types of spatial information related to devices of or proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 41, Mulgund shows

determining a mote-network address of the mote of the first set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information of other motes proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of absolute spatial information of other motes proximate to the mote.

Kung shows determining one or more types of absolute spatial information of other motes proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by determining one or more types of absolute spatial information of other motes proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 49, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-

addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 58, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung)

and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 61, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 63, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claims 65 and 66, Mulgund shows:

aggregating at least a part of a mote-addressed index of a multi-mote content index (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

Mulgund does not show that a mote-addressed index is a routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index being aggregated in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

Alternatively to Kung, Madden (reference used in rejection of claim 67 below) shows a mote-addressed routing/spatial index at a mote (under 2.2 communication in sensor networks, paragraph 2).

As to claim 70, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 72, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position

of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 88, Mulgund shows:

determining a mote-network address of a mote of the second set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information related to devices of or proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of spatial information related to devices of or proximate to the mote.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by determining one or more types of spatial information related to devices of or proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 89, Mulgund shows

determining a mote-network address of the mote of the second set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information of other motes proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of absolute spatial information of other motes proximate to the mote.

Kung shows determining one or more types of absolute spatial information of other motes proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by determining one or more types of absolute spatial information of other motes proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 97, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 113, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 10.

As to claim 118, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 58.

As to claim 132, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 13.

As to claim 134, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 15.

As to claim 136, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 10.

As to claim 139, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 61.

As to claim 141, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 63.

As to claim 143, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 58.

As to claim 157, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 132.

As to claim 159, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 134.

As to claim 161, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 136.

As to claim 164, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 139.

As to claim 166, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 141.

As to claim 168, Mulgund in view of Bennett and in further view of Kung shows all the elements, as discussed above with respect to claim 143.

19. Claims 19, 25, 31-35, 37, 67, 73, 79-83, and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. and in further view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al.

As to claim 19, Mulgund shows:

migrating to a mote of the first set of motes [visiting a first sensor node] (paragraph [0007] lines18-19, paragraph [0062]); and

receiving at least a part of one or more mote-addressed content indexes with the multi-mote index creation agent [interrogating a node with a network modeling agent retrieving the information stored at the node (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that

collects data from sensors and stores it in the knowledge base. However, the management module per se is not explicitly shown.

Madden shows installing a multi-mote index creation agent at the mote comprising a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing a multi-mote index creation agent at the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 25, alternatively to Mulgund, Madden et al. shows:

determining at least one of a sensing function or a control function at a mote [sampling a sensor *s* to evaluate any predicate over the attribute *sensors.s* (section 4.2 Ordering of Sampling And Predicates)]; and

creating one or more mote-addressed content indexes in response to said determining [creating and maintaining a catalog of metadata that describes a particular mote's local attributes, events, and information about the costs of processing and delivering data (section 4.1 Metadata Management, and Table 2, and 3)].

Madden also shows that recited functions are performed by a TinyDB (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by performing the steps of

determining and creating in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 31, Mulgund in view of Bennett and in further view of Madden shows creating at least one extensible index [a sensors table, which is conceptually unbounded (section 3.1 paragraph 3) in Madden].

As to claim 32, Mulgund in view of Bennett and in further view of Madden shows creating the at least one extensible index in response to a type of content indexed [creating a sensors table in response to light and temperature readings selected as a type of content requested from sensors (section 3.1 paragraph 3 in Madden)].

As to claim 33, Mulgund in view of Bennett and in further view of Madden shows creating at least one a mote-addressed sensing index [a sensor table of sensors' readings (section 3.1 paragraph 3 in Madden)].

As to claim 34, Mulgund in view of Bennett and in further view of Madden shows creating at least one of a mote-addressed routing/spatial index [a list of neighbors and some routing information about the connectivity of those neighbors to the rest of the network (section 2.2 Communication in Sensor Networks, paragraph 2 in Madden)].

As to claim 35, Mulgund in view of Bennett and in further view of Madden shows inserting at least one device identifier in the one or more mote-addressed content indexes [nodeid that is selected to be reported in the sensors table (section 3.1 in Madden, see the first query)].

As to claim 37, Mulgund shows:

migrating to a mote of the first set of motes [visiting a first sensor node] (paragraph [0007] lines18-19); and

querying at least one device entity with the index creation agent [interrogating a node with a network modeling agent] (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base, however, the management module per se is not explicitly shown.

Madden shows installing an index creation agent at the mote [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network] (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing an index creation agent at the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 67, Mulgund shows:

migrating to a mote of the second set of motes [visiting a first sensor node] (paragraph [0007] lines 18-19, paragraph [0062]); and

receiving at least a part of one or more mote-addressed content indexes with the multi-mote index creation agent [interrogating a node with a network modeling agent retrieving the information stored at the node (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base. However, the management module per se is not explicitly shown.

Madden shows installing a multi-mote index creation agent at the mote comprising a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing a multi-mote index creation agent at the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 735, alternatively to Mulgund, Madden et al. shows:

determining at least one of a sensing function or a control function at a mote [sampling a sensor *s* to evaluate any predicate over the attribute *sensors.s* (section 4.2 Ordering of Sampling And Predicates)]; and

creating one or more mote-addressed content indexes in response to said determining [creating and maintaining a catalog of metadata that describes a particular mote's local attributes, events, and information about the costs of processing and delivering data (section 4.1 Metadata Management, and Table 2, and 3)].

Madden also shows that recited functions are performed by a TinyDB (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by performing the steps of determining and creating in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 79, Mulgund in view of Bennett and in further view of Madden shows creating at least one extensible index [a sensors table, which is conceptually unbounded (section 3.1 paragraph 3) in Madden].

As to claim 80, Mulgund in view of Bennett and in further view of Madden shows creating the at least one extensible index in response to a type of content indexed [creating a sensors table in response to light and temperature readings selected as a type of content requested from sensors (section 3.1 paragraph 3 in Madden)].

As to claim 81, Mulgund in view of Bennett and in further view of Madden shows creating at least one a mote-addressed sensing index [a sensor table of sensors' readings (section 3.1 paragraph 3 in Madden)].

As to claim 82, Mulgund in view of Bennett and in further view of Madden shows creating at least one of a mote-addressed routing/spatial index [a list of neighbors and some routing information about the connectivity of those neighbors to the rest of the network (section 2.2 Communication in Sensor Networks, paragraph 2 in Madden)].

As to claim 83, Mulgund in view of Bennett and in further view of Madden shows inserting at least one device identifier in the one or more mote-addressed content indexes [nodeid that is selected to be reported in the sensors table (section 3.1 in Madden, see the first query)].

As to claim 85, Mulgund shows:

migrating to a mote of the second set of motes [visiting a first sensor node] (paragraph [0007] lines18-19); and

querying at least one device entity with the index creation agent [interrogating a node with a network modeling agent] (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node

(paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base, however, the management module per se is not explicitly shown.

Madden shows installing an index creation agent at the mote [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network] (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing an index creation agent at the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

20. Claims 26 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al. and in further view of Chiloyan et al. (US Patent No.: 7,165,109).

As to claims 26 and 74, Mulgund in view of Bennett and in further view of Madden shows all the elements except for accessing at least one device entity registry.

Chiloyan shows accessing at least one device entity registry comprising having an operational system accessing device registry to check if the particular peripheral device model is included in the current device registry (col. 1 lines 50-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and Madden by accessing

at least one device entity registry in order to check if the particular device model and necessary information about the device is in the registry (col. 1 lines 58-63 in Chiloyan).

21. Claims 27-30 and 75-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al. and in further view of Godlewski (US Patent No.: 6,421,354).

As to claims 27 and 75, Madden shows communicating with at least one device comprising a sensor to collect its reading data (section 3.1 Basic Language Features) and store it in a sensors table (lines 1-20).

Mulgund in view of Bennett and in further view of Madden does not expressly shows that communication is established with at least one device-associated entity.

Godlewski shows communicating with at least one device-associated entity comprising a sensor interface (Fig. 1 and Fig. 4) (col. 1 lines 45-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and Madden by communicating with at least one device-associated entity in order to receive data from a sensor in the appropriate format (col. 1 lines 45-55 in Godlewski).

As to claims 28 and 76, Mulgund in view of Bennett, Madden and in further view of Godlewski shows communicating with at least a light device entity (col. 5 lines 58-67 and col. 6 lines 1-10 in Godlewski).

As to claims 29 and 77, Mulgund in view of Bennett and in further view of Madden shows accessing at least one device identifier of a mote-addressed content index (section 3.1 Basic Language Features lines 14-16 in Madden).

As to claims 30 and 78, Mulgund in view of Bennett, Madden and in further view of Godlewski shows communicating with at least one device entity using a common application protocol (Fig. 6 col. 13 lines 7-42 in Godlewski).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and Madden by communicating with at least one device entity using a common application protocol in order to transmit data from a sensor to the communicator using sensor interface software (col. 13 lines 35-42 in Godlewski).

22. Claims 47 and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. and in further view of Regli et al. (US 2005/0141706 A1).

Claims 47 and 95 will be examined as best understood.

As to claim 47 (and claim 95 by extension), Mulgund in view of Bennett shows all the elements except for encryption utilizing at least one of a private or a public key.

Regli shows encryption utilizing at least one of a private or a public key (paragraph [0056]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by encryption utilizing at least one of a private or a public key in order to support encrypted communication at the network layer between wireless devices (paragraphs [0054]-[0056] in Regli).

23. Claims 102, 103, 106, 123, 124, 127, 148, 149, 152, 173, 174, and 177 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. and in further view of Nelson (US 2004/0122849 A1).

As to claim 102, Mulgund in view of Bennett shows all the elements except for generating the federated index to have one or more entries noting one or more respective administrative domains of one or more content index entries.

Nelson shows generating the federated index [database table] to have one or more entries noting one or more respective administrative domains of one or more content index entries (abstract, Figs. 3A-3C, par. [0017]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by generating the federated index to have one or more entries noting one or more respective administrative domains of one or more content index entries in order to limit a user access to documents in the database only to the user's own domain (abstract in Nelson).

As to claim 103, Mulgund in view of Bennett shows all the elements except for generating the federated index to have access information to one or more content indexes for an administered content index.

Nelson shows generating the federated index [database table] to have access information [domain ID] to one or more content indexes for an administered content index (abstract, Figs. 3A-3C and 7, par. [0017]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by generating the federated index to have access information to one or more content indexes for an administered content index in order to limit a user access to documents in the database only to the user's own domain (abstract in Nelson).

As to claim 106, Mulgund in view of Bennett shows all the elements except for generating the federated index to have metadata pertaining to an administrative domain, wherein the metadata includes an ownership indicator.

Nelson shows generating the federated index [database table] to have metadata pertaining to an administrative domain, wherein the metadata includes an ownership indicator (par. [0040], Fig. 3C).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by generating the federated index to have metadata pertaining to an administrative domain, wherein the

metadata includes an ownership indicator in order to limit a user access to documents in the database only to the user's own domain (abstract in Nelson).

As to claim 123, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 102.

As to claim 124, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 103.

As to claim 127, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 106.

As to claim 148, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 102.

As to claim 149, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 103.

As to claim 152, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 106.

As to claim 173, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 102.

As to claim 174, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 103.

As to claim 177, Mulgund in view of Bennett and in further view of Nelson shows all the elements, as discussed above with respect to claim 106.

24. Claims 107, 128, 153, and 178 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett and in further view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al.

As to claim 107, Mulgund in view of Bennett shows all the elements except for having an administrative domain-specific query string generated for or supplied by an administrative domain to produce an updated content index for that domain.

Madden shows having an administrative domain-specific query string generated for or supplied by an administrative domain to produce an updated content index for that domain (abstract, section 1.1 the TAG Approach).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having an administrative domain-specific query string generated for or supplied by an

administrative domain to produce an updated content index for that domain in order produce updated content index (Mulgund, par. [0041]).

As to claim 128, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 107.

As to claim 153, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 107.

As to claim 178, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 107.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLEG SURVILLO whose telephone number is (571)272-9691. The examiner can normally be reached on M-Th 8:30am - 6:00pm; F 8:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on 571-272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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